

REMARKS

Amendment summary

Upon entry of this Amendment, claims 1-16 will be pending.

Claim 1 is amended to recited a single continuous light-permeable first layer. Support for this amendment is found, e.g., in Example 1 and Figure 1 of the present specification.

No new matter is added by this Amendment, and Applicant respectfully requests entry of the Amendment, as placing this case in condition for allowance.

Response to rejections of claims 1-16

Claims 1 and 3-15 are rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by Chen et al (“Microstructural investigation of oxidized Ni/Au ohmic contact to p-type GaN”) (hereinafter “Chen”). Claim 2 is rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Chen in view of Sheu et al (“The effect of thermal annealing on the Ni/Au contact of p-type GaN) (hereinafter “Sheu”). Finally, claim 16 is rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over Chen in view of Chen et al (U.S. Patent Publication No. 2003/0010994 A1) (hereinafter “ChenJ”).

Applicant notes that the present claims have been amended in response to the position set forth in the Office Action that the claims read on the presence of multiple islands. Accordingly, Applicant respectfully submits that the cited prior art does not anticipate or render obvious the presently claimed invention because the cited prior art does not disclose or suggest the presently recited single continuous light permeable first layer.

Independent claim 1 recites an electrode for use in a gallium nitride-based compound semiconductor light-emitting device comprising a single continuous light-permeable first layer which is in contact with a surface of a p-contact layer in a gallium nitride-based compound semiconductor light-emitting device and which is capable of providing ohmic contact, and a second layer which is in contact with a part of a surface of said p-contact layer. The first layer comprises a metal, or an alloy of two or more metals, selected from a first group consisting of Au, Pt, Pd, Ni, Co, and Rh, and the second layer comprises an oxide of at least one metal selected from a second group consisting of Ni, Ti, Sn, Cr, Co, Zn, Cu, Mg, and In. In addition, the second layer is parted in plural portions on the surface of the p-contact layer.

As seen in Figure 1 of the present specification, the presently recited first layer (11), comprising a metal or alloy, exists in the form of a single continuous layer in contact with a surface of a p-contact layer (6). On the other hand, the second layer (12), comprising a metal oxide, is parted in plural portions on the surface of a p-contact layer (6), and exists in the form of islands in the continuous first layer.

An electrode having excellent light permeability and low contact resistance is obtained by distributing the metal or alloy layer and the metal oxide layer in the presently recited configuration.

Figure 1 also illustrates a pore (14), which has a diameter of 50 to 200 nm (see page 8, lines 1 to 2 in the present specification). Pore (14) does not break the plane surface continuity of the first layer (11). Also, as described on page 8, lines 14 to 17 in the present specification, the

number and pore size of the pores can be regulated by controlling annealing conditions (e.g., temperature and time), depending on the metallic species employed.

In Example 1 of the present invention (see pages 13-16 of the present specification), which corresponds to Figure 1, a Au film having a thickness of 5 nm and a Ni film having a thickness of 7.5 nm were formed in this sequence. The laminated film was then annealed at a temperature of 450°C for 5 minutes (see page 14 line 26 to 35 in the present specification).

Conversely, in Chen, a Ni film having a thickness of 10 nm and a Au film having a thickness of 5 nm were sequentially formed, and then the resulting laminated film was annealed at a temperature of 500°C for 10 minutes (see the first paragraph of the EXPERIMENT section and FIG. 7(a) in Chen).

Without wishing to be bound by this theory, the different preparation conditions present in Chen may contribute to the different structure disclosed in Chen. As described above, the presently claimed invention differs from Chen, both in the order in which the Au and Ni layers are formed and also in the thickness of the metal films formed. The presently claimed invention also differs from Chen with respect to the annealing conditions (e.g., the temperature and time used to anneal the films). These differences may be a reason that the first layer in Chen exists in the form of multiple islands, whereas the first layer in the presently claimed invention is present as a single continuous layer.

Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the

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Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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